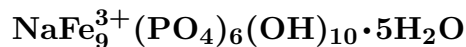


Kidwellite

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Crystal Data: Monoclinic. *Point Group:* $2/m$, m , or 2 . Acicular crystals are elongated along [010] and flattened on {100}, to 50 μm ; typically in mats, tufts, or rosettes of feathery crystals; as spheroidal to botryoidal masses and crusts.

Physical Properties: *Cleavage:* Perfect on {100}. *Hardness* = 3 *D*(meas.) = > 3.3 *D*(calc.) = 3.34

Optical Properties: Transparent to translucent. *Color:* Bright yellow to greenish yellow, pale chartreuse-green, greenish white; colorless in transmitted light. *Streak:* Yellow. *Luster:* Silky. *Optical Class:* Biaxial (-). *Orientation:* $Y = b$. $\alpha = 1.787(5)$ $\beta = 1.800(5)$ $\gamma = 1.805(5)$ $2V$ (meas.) = Large.

Cell Data: *Space Group:* $A2/m$, Am , or $A2$. $a = 20.61(7)$ $b = 5.15(1)$ $c = 13.75(6)$ $\beta = 112.64(15)^\circ$ $Z = 2$

X-ray Powder Pattern: Fodderstack Mountain, Arkansas, USA. 9.41 (100), 3.413 (55), 3.813 (40), 3.193 (40), 4.017 (35), 3.173 (35), 6.43 (30)

| Chemistry: | (1) | (2) |
|-------------------------|----------|--------|
| P_2O_5 | 31.3 | 31.41 |
| SiO_2 | 0.27 | |
| Al_2O_3 | 0.98 | |
| Fe_2O_3 | 52.3 | 53.01 |
| MnO | 0.02 | |
| MgO | 0.01 | |
| Na_2O | 1.60 | 2.29 |
| H_2O^+ | 13.3 | |
| H_2O^- | 0.3 | |
| H_2O | | 13.29 |
| Total | [100.08] | 100.00 |

(1) Fodderstack Mountain, Arkansas, USA; original total given as 100.07%, corresponds to $\text{Na}_{0.71}(\text{Fe}_{8.91}\text{Al}_{0.26})_{\Sigma=9.17}(\text{PO}_4)_6(\text{OH})_{10} \cdot 5\text{H}_2\text{O}$. (2) $\text{NaFe}_9(\text{PO}_4)_6(\text{OH})_{10} \cdot 5\text{H}_2\text{O}$.

Occurrence: As a late-stage replacement of earlier phosphate minerals.

Association: Rockbridgeite, beraunite, strengite, laubmannite, dufrénite, chalcosiderite, goethite.

Distribution: In the USA, in Arkansas, from the Coon Creek and York mines, Polk Co; on Fodderstack Mountain, Montgomery Co.; and on Buckeye Mountain, at Three Oak Gap; in Alabama, from Indian Mountain, Cherokee Co.; at Irish Creek, Rockbridge Co., Virginia. In Germany, from the Rotläufchen mine, Waldgirmes, near Giessen, and the Eleonore mine, Hesse; and in the Clara mine, near Oberwolfach, Black Forest. At the Phoenix United mines, Linkinhorne, Cornwall, England. In Australia, from Broken Hill, New South Wales; in the Iron Monarch quarry, Iron Knob, South Australia; and at the Lake Boga granite quarry, near Swan Hill, Victoria. In the Okatjimukuju pegmatite, near Karibib, Namibia.

Name: Honors Albert Laws Kidwell (1919–), Houston, Texas, USA, for his study of Arkansas phosphate deposits.

Type Material: National Museum of Natural History, Washington, D.C., USA, 137024.

References: (1) Moore, P.B. and J. Ito (1978) Kidwellite, $\text{NaFe}_9^{3+}(\text{OH})_{10}(\text{PO}_4)_6 \cdot 5\text{H}_2\text{O}$, a new species. *Mineral. Mag.*, 42, 137–140. (2) (1979) *Amer. Mineral.*, 64, 242–243 (abs. ref. 1). (3) Braithwaite, R.S.W. and H. Corke (1980) Kidwellite from Cornwall. *Mineral. Mag.*, 43, 952–953.

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